

APPENDIX C. RESULTS FOR MULTIVARIATE ANALYSES

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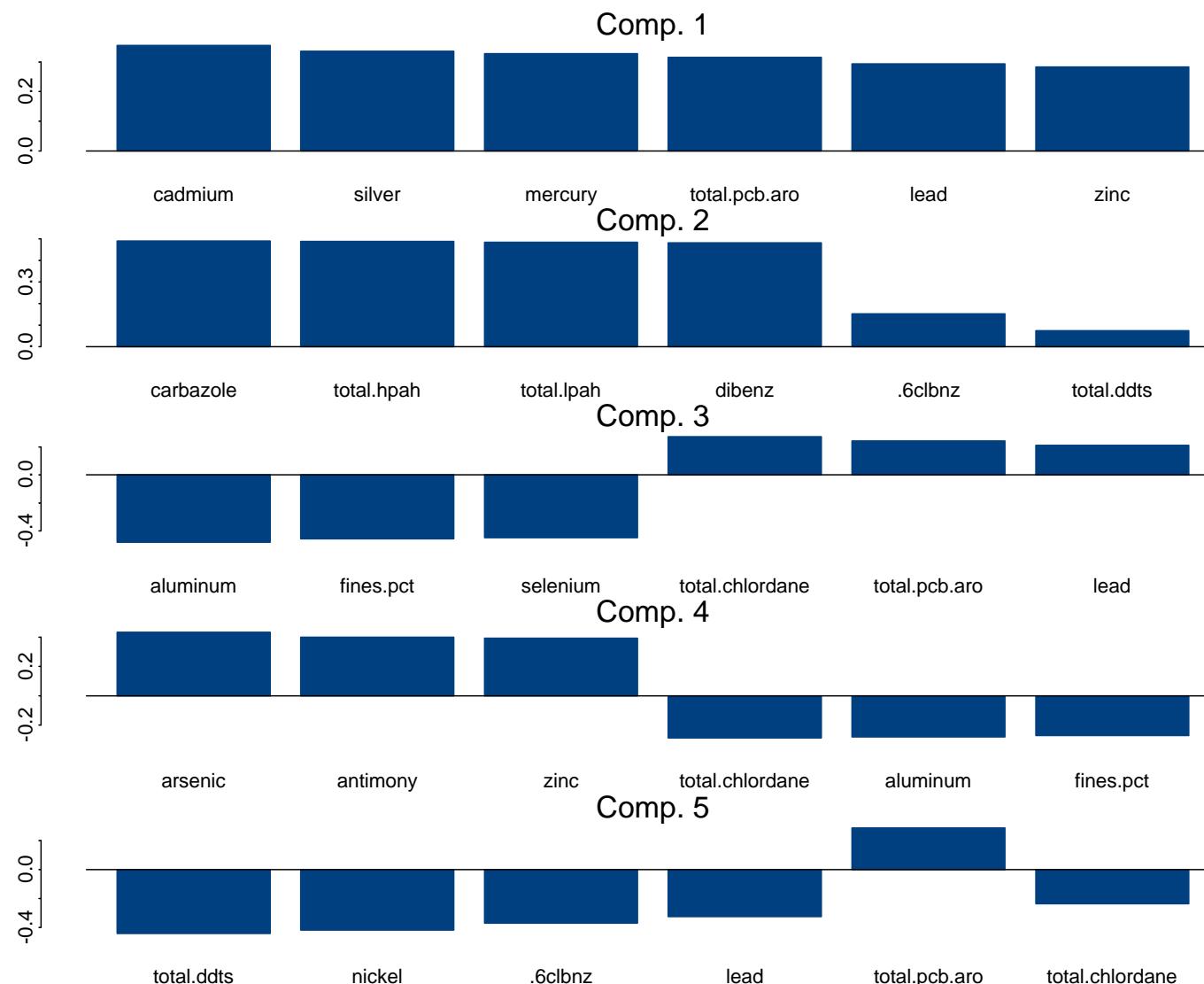


Figure C-1. Loadings plot, showing correlations between original (scaled) variables and first five principal components.

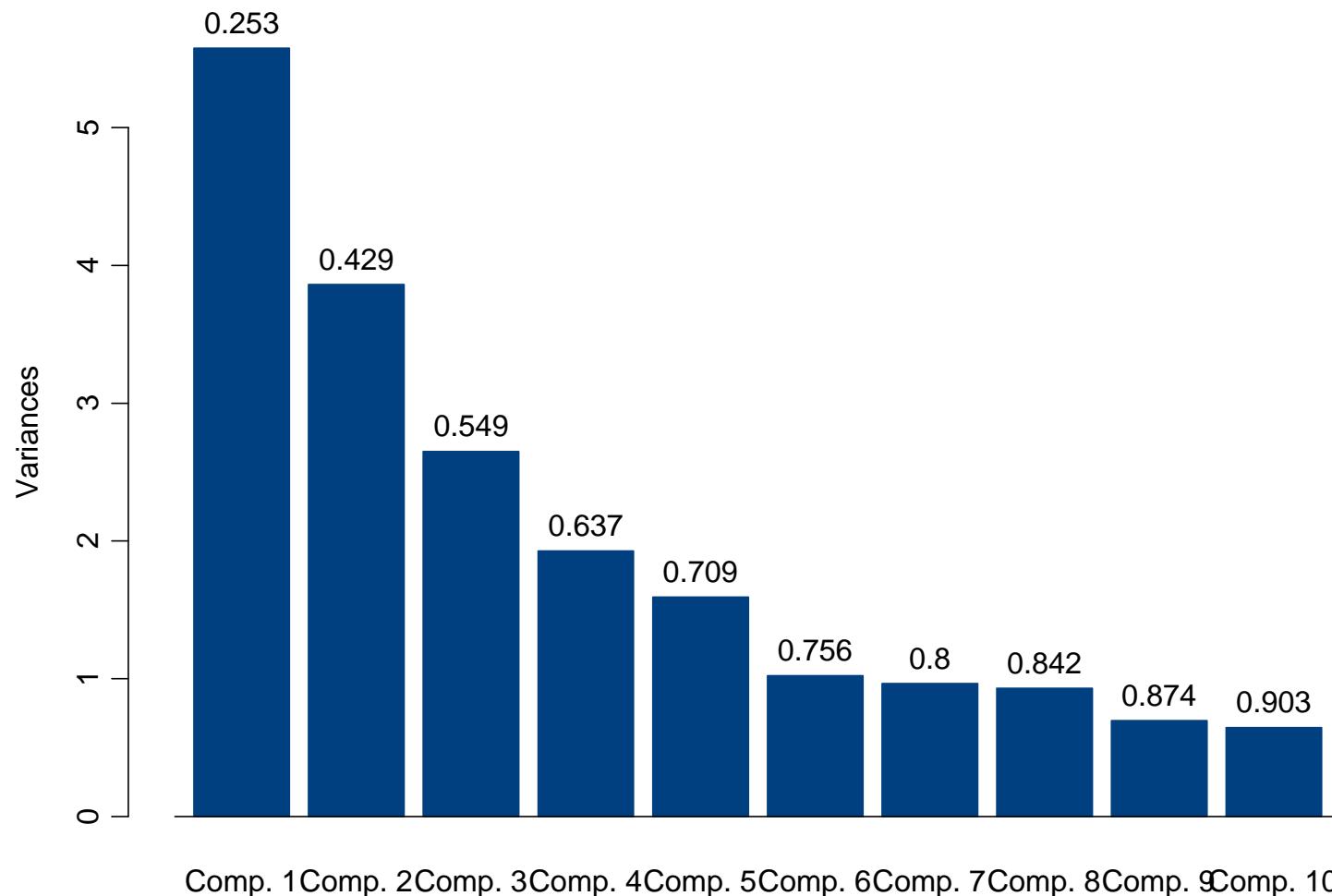


Figure C-2. Screeplot showing the cumulative variance explained by each successive principal component.

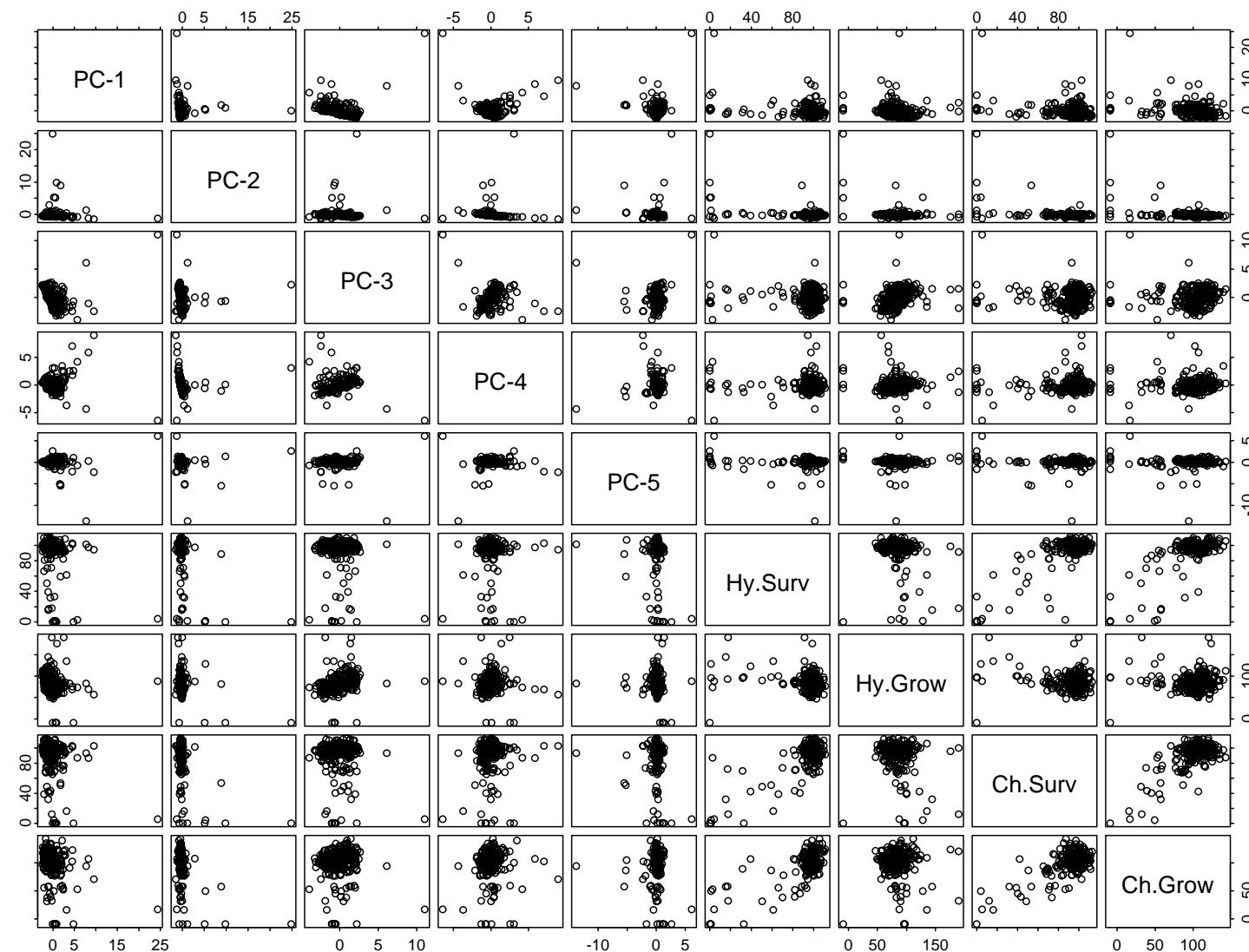


Figure C-3. Matrix of pair wise scatter plots between first five principal components and control-adjusted biological endpoints.

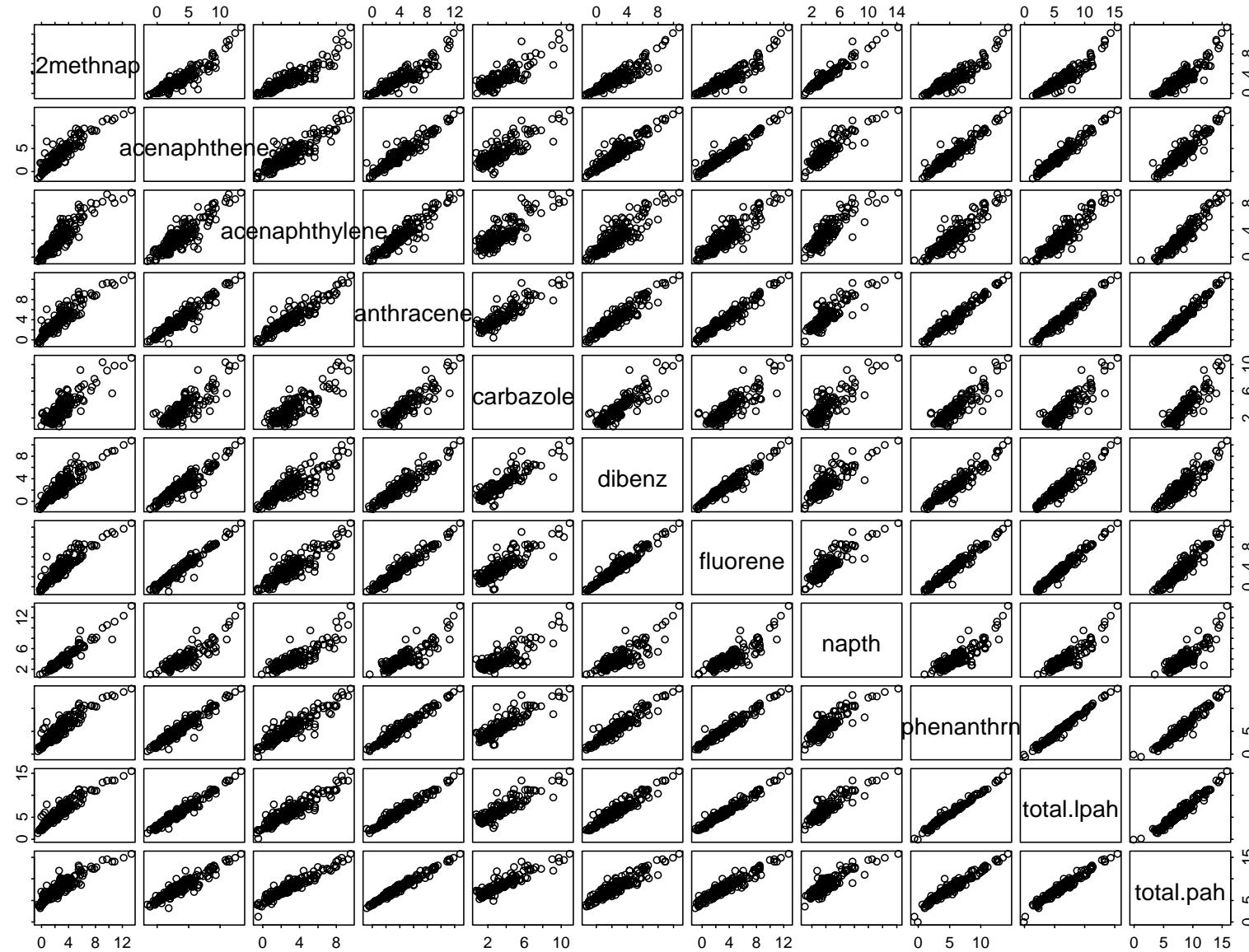


Figure C-4. Pairs plots for individual LPAHs, and sum of LPAHs and total PAHs, plus carbazole and dibenzofuran.

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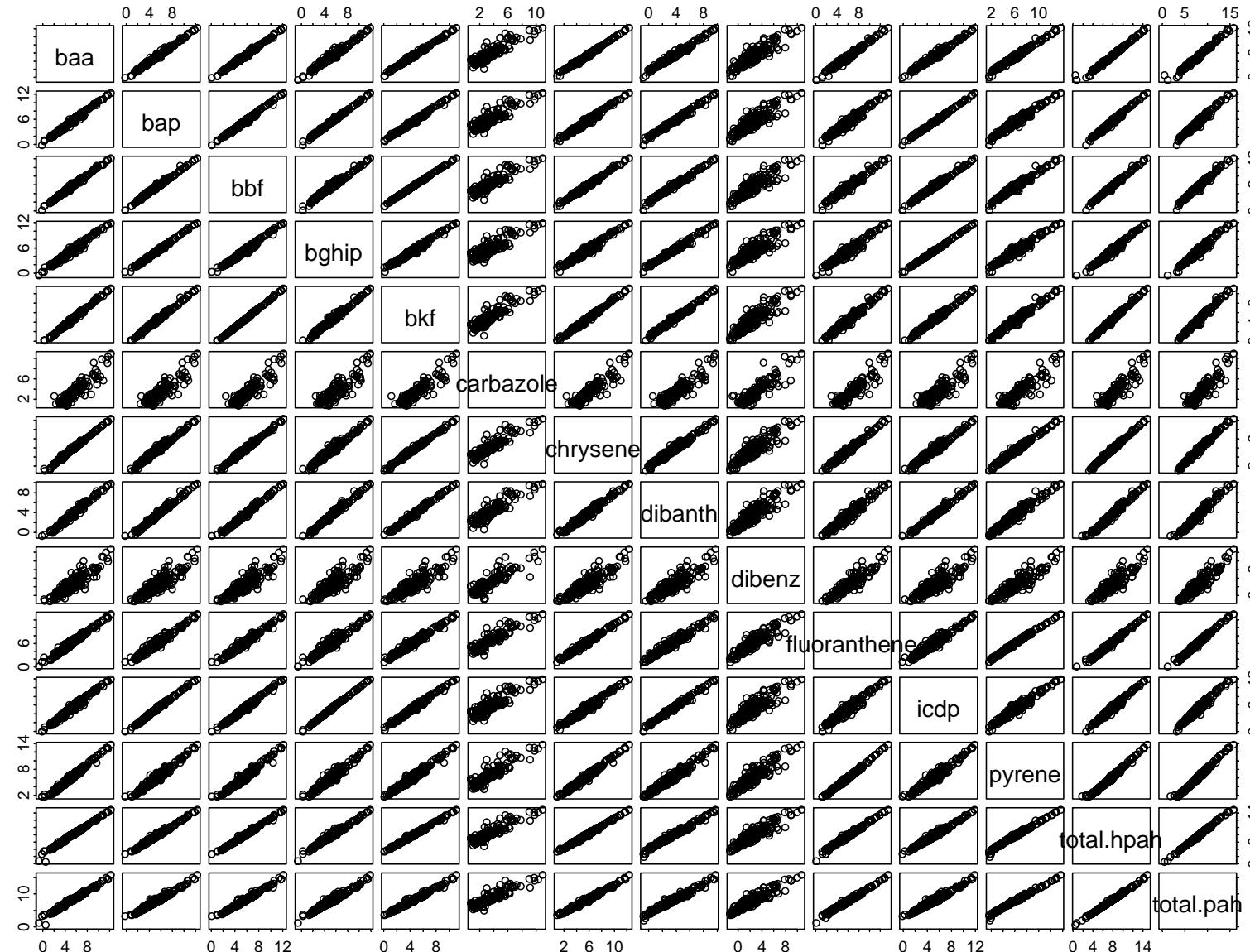


Figure C-5. Pairs plots for individual HPAHs, sum of HPAHs and total PAHs, plus carbazole and dibenzofuran.

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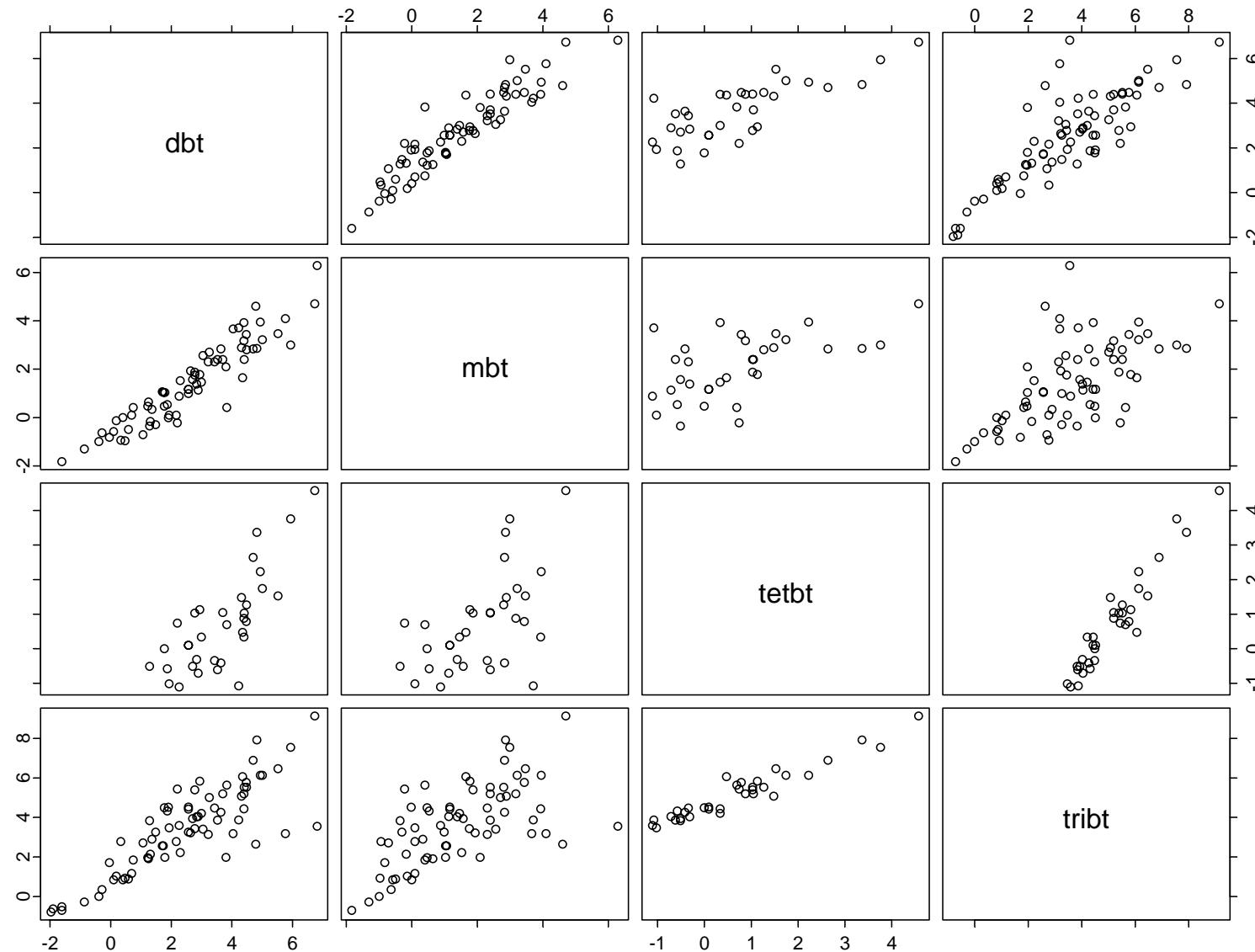


Figure C-6. Pairs plots for organotins.

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Figure C-7. Pairs plots for pesticides, phenols, and phthalates

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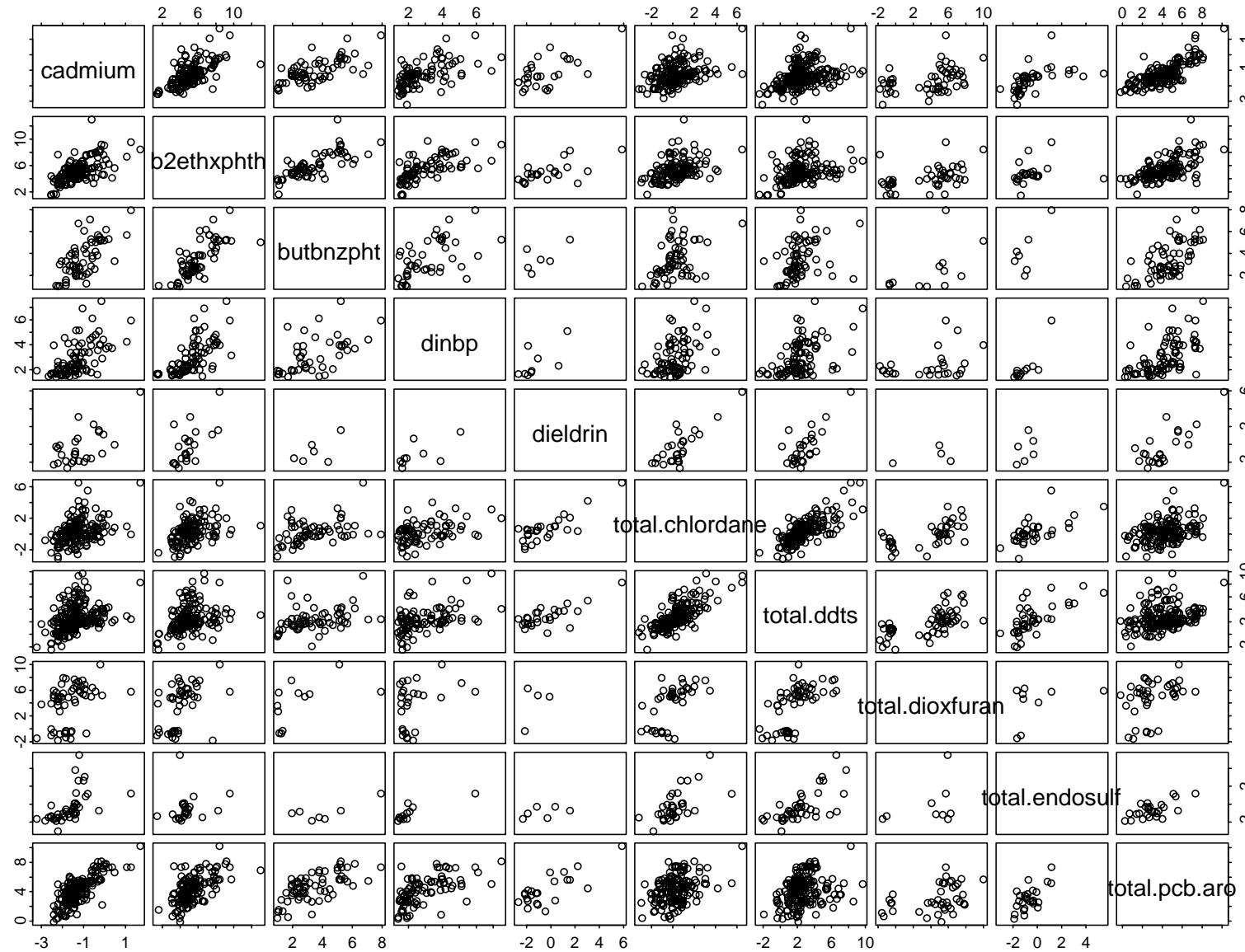


Figure C-8. Pairs plots for phthalates, cadmium, dieldrin, and totals for chlordane, ddts, dioxin/furans, endosulfan, and PCBs.

Table C-1. Description of stations in groups formed within a distance of 7.5.

GROUP #	STATIONS							
1	G283	G288	G294-1	G301				
2	G092	G455	G467	G473				
3	D1-1	G007-1	G009	G010	G011	G015	G017	G020
	G024	G026	G035	G066	G077	G085	G086	G088
	G090	G091	G093	G099	G103	G106	G109	G112
	G117	G121	G122	G123	G133	G136	G155	G166
	G172	G198	G199	G203-1	G228	G230	G240	G242
	G245	G267	G268	G276	G278	G282	G284	G296
	G302	G315	G334	G339	G345-1	G353-1	G359	G362-1
	G366	G368	G372-1	G376	G382	G384-1	G385	G387
	G392	G393	G398	G408	G415	G416	G426	G444
	G450-1	G457	G458	G461	G468	G469	G474	G477
4	G497	U6TOC-2	U6TOC-3					
	D2	G027	G033	G034	G038	G060	G062	G064
	G067	G073	G074	G078	G079	G080	G082	G083
	G089	G096	G105	G124	G127	G130	G139	G142
	G147	G157	G160	G161	G163	G164	G170	G176
	G178	G179	G180	G182	G184	G187	G197-1	G200
	G202	G204	G205	G206	G207	G209	G210	G212-1
	G213	G220	G221	G227	G231	G232	G234	G235
	G244	G247	G254	G260	G273	G274	G277	G280
	G292	G295	G303	G308	G316	G318	G320	G321
	G323	G324-1	G327	G329	G331	G333	G335	G336
	G342	G346	G347	G348	G350	G351	G352	G364
	G371	G377	G380	G386	G389	G396	G401	G403
	G405	G409	G413	G417	G420	G425	G430	G437
	G441	G454	G480	G492-1	U1C-1	U1C-2	U1C-3	U2C-1
	U2C-2	U2C-3	U3C-1	U3C-2	U3C-3	U4Q-1	U4Q-2	U4Q-3
	U5Q-1	U5Q-2	U5Q-3	U6TOC-1				
5	G019	G025	G383					
6	G111							
7	G263							
8	G264							
9	G270-1							
10	G298							
11	G311-1							
12	G355							
13	G360							
14	G367							
15	G390							
16	G445							
17	G453							
18	G456							

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Table C-2a. Chemical and biological characteristics by cluster analysis groups defined in Table C-1: metals

GROUP NO.	STATION COUNT	MEAN VALUES BY GROUP											
		ALUMINUM	ANTIMONY	ARSENIC	CADMIUM	CHROMIUM	COPPER	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	ZINC
1	4	24,500	0.19	3.46	0.31	31	41	26	0.12	34	0.16	0.34	139
2	4	16,825	6.97	8.61	1.49	67	139	185	0.19	36	0.14	0.30	464
3	83	27,323	0.44	5.01	0.43	41	94	33	0.10	27	0.17	0.28	191
4	124	17,584	0.25	3.72	0.19	24	38	20	0.08	21	0.07	0.15	105
5	3	9,060	0.56	3.21	0.68	169	32	27	0.03	17	0.05	0.19	388
G111	6	21,600	1.94	15.50	3.51	103	216	120	0.27	78	0.06	0.62	1,940
G263	7	27,500	1.24	6.52	0.26	41	47	46	0.06	200	0.10	0.19	111
G264	8	24,400	0.46	4.94	0.37	34	55	27	0.17	52	0.20	0.53	160
G270-1	9	26,100	0.13	4.46	0.27	34	43	684	0.08	36	0.26	0.22	130
G298	10	20,200	0.19	2.23	0.25	26	31	18	0.08	26	0.09	0.36	101
G311-1	11	41,200	0.12	3.76	0.45	43	54	32	0.43	34	0.28	0.58	145
G355	12	17,300	1.93	8.37	0.29	48	147	1290	0.08	102	0.06	0.19	144
G360	13	20,800	0.26	7.43	0.35	58	101	33	0.06	29	0.11	0.26	136
G367	14	14,700	1.46	6.70	0.54	33	97	69	0.15	19	0.05	0.20	262
G390	15	28,000	1.89	16.50	0.66	51	1,080	102	0.30	32	0.20	0.64	731
G445	16	24,100	18.70	34.00	0.76	60	257	454	0.45	34	0.17	1.13	1,360
G453	17	20,200	6.37	7.30	5.41	146	120	956	2.01	22	0.16	4.44	561
G456	18	21,900	19.30	22.90	0.34	43	359	66	0.06	31	0.19	0.34	457

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Table C-2b. Chemical and biological characteristics by cluster analysis groups defined in Table C-1: organic chemicals

GROUP #	STATION COUNT	MEAN VALUES BY GROUP, CONT.								
		BIS(2) ETHYLHEXYL PHTHALATE	CARBAZOLE	DIBENZ	HEXACHLORO- BENZENE	TOTAL CHLORDANE	TOTAL DDTs	TOTAL HPAH	TOTAL LPAH	TOTAL PCBS
1	4	395	10948	10350	4.1	4.1	590	1035475	893,725	25
2	4	1103	188	160	1.0	7.7	48	9231	4220	1,258
3	83	927	158	24	4.7	3.8	171	8212	1550	339
4	124	140	53	75	3.4	1.4	51	14986	4226	48
5	3	740	7	5	1.8	0.9	8	1138	139	666
G111	6	14,000	13	6	17.0	0.9	11	832	182	1,530
G263	7	52	220	42	0.1	0.3	34	39030	18,040	3.17
G264	8	940	30,000	2,600	1200.0	2.1	103	1312000	396,600	4.64
G270-1	9	230	760	420	2.3	4.7	39	164800	65,400	4.3
G298	10	340	56,000	46,000	0.3	0.6	2,309	2812000	5,134,000	14.2
G311-1	11	33	93	255	3.9	246.0	1,725	54825	27,230	170
G355	12	330	370	76	338.0	668.8	11,480	143000	6,338	-1000
G360	13	800	14	2.8	5.5	22.4	16,171	849	91	151
G367	14	440,000	31	12	34.0	2.8	21	4656	964	981
G390	15	3000	160	89	0.9	25.4	62	12650	3,078	1430
G445	16	310	52	67	2.2	1.7	135	3805	1620	271
G453	17	4500	29	190	4.6	659.8	3,928	2268	3,370	27,370
G456	18	460	110	86	0.2	9.0	28	4481	1,444	188.8

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Table C-2c. Chemical and biological characteristics by cluster analysis groups defined in Table C-1: conventionals

GROUP #	STATION COUNT	MEAN VALUES BY GROUP, CONT.					COMMENTS
		FINES (%)	HYALELLA SURVIVAL	HYALELLA GROWTH	CHIRONOMUS SURVIVAL	CHIRONOMUS GROWTH	
1	4	62	25	108	26	78	High PAHs, carbazole, dibenzofuran
2	4	35	73	82	69	107	
3	83	71	96	80	90	100	
4	124	30	95	87	94	105	
5	3	2	96	152	97	120	
G111	6	1	45	97	69	87	High As, Zn, and Cu
G263	7	1	47	107	72	90	High nickel
G264	8	1	69	89	81	53	High PAHs, carbazole, dibenzofuran, and hexachlorobenzene
G270-1	9	1	61	93	70	74	High lead
G298	10	1	56	0		0	Highest PAHs, carbazole, dibenzofuran; high DDTs; no survival
G311-1	11	1	89	61	135	16	High chlordane and aluminum
G355	12	1	19	101	83	93	High chlordane, DDTs and lead; but good survival
G360	13	1	63	59	98	51	Highest DDTs
G367	14	1	18	101	83	101	High b2ethxphth
G390	15	1	83	3	73	87	High As, Zn, and Cu
G445	16	1	71	94	57	103	High Sb, As, Zn, and Cu
G453	17	1	64	4	88	5	Highest PCBs; high chlordane and DDTs and low survival
G456	18	1	41	103	69	103	High Sb, As, Zn, and Cu

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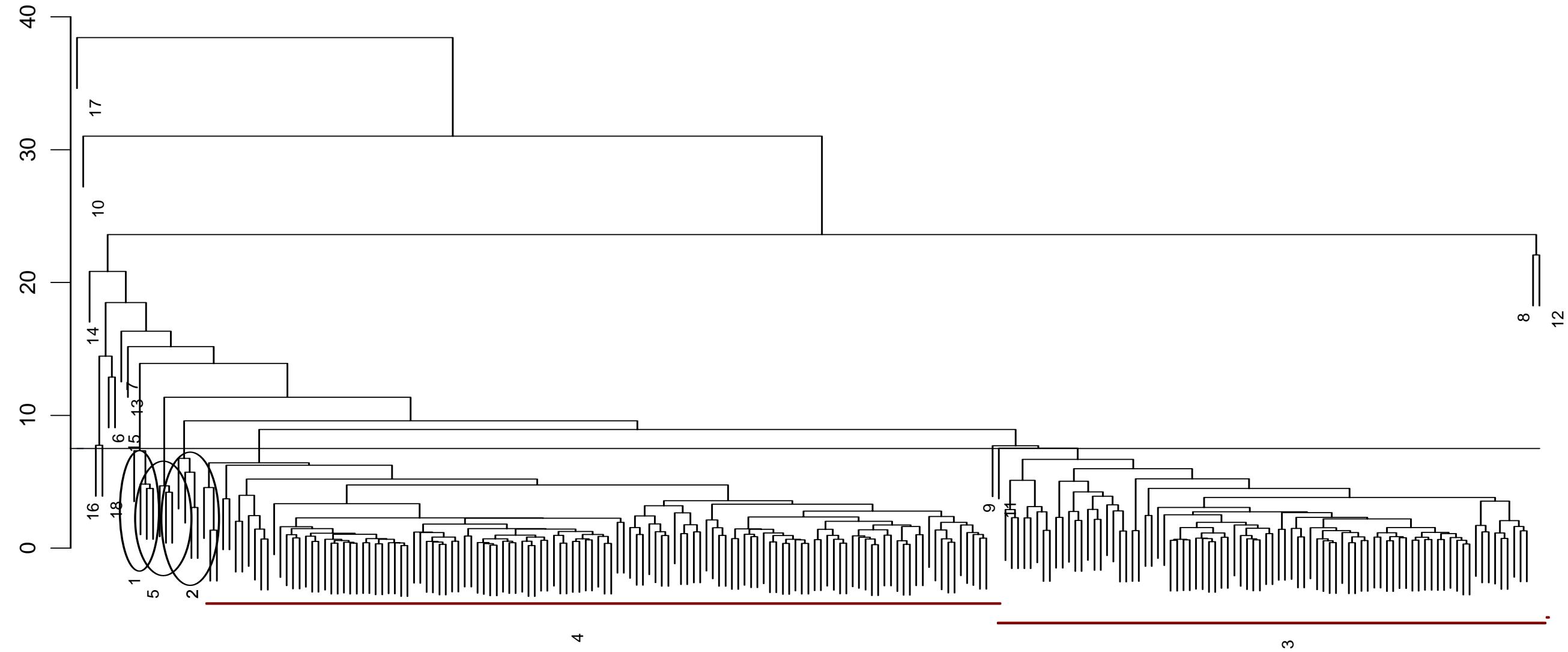


Figure C-9. Dendrogram of stations